

Abstract

A process for variably preparing mixtures of optionally alkyl-substituted BDO, GBL and THF by two-stage hydrogenation in the gas phase of C_4 dicarboxylic acids and/or derivatives thereof, which comprises

- a) hydrogenating in a gas phase a gas stream of C_4 dicarboxylic acids and/or derivatives thereof over a particular catalyst at a particular pressure and temperature to give a stream mainly containing of optionally alkyl-substituted GBL and THF,
 - b) removing any succinic anhydride,
 - c) converting the products remaining predominantly in the gas phase in the partial condensation, THF, water and GBL to give a stream comprising a mixture of BDO, GBL and THF,
 - d) removing the hydrogen from the products and recycling it into the hydrogenation,
 - e) distillatively separating the products THF, BDO, GBL and water, if appropriate recycling a GBL-rich stream, or if appropriate discharging it, and working up BDO, THF and GBL distillatively,
- and setting the ratio of the products, THF, GBL and BDO, relative to one another within the range from 10 to 100% by weight of THF, from 0 to 90% by weight of GBL and from 0 to 90% by weight of BDO only by varying the temperatures in the two hydrogenation zones and also if appropriate the GBL recycle stream.